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EXAMINER

TORRES, JOSEPH D

ART UNIT PAPER NUMBER

2133

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/091,279	<b>Applicant(s)</b> GUEGUEN, ARNAUD	
	<b>Examiner</b> Joseph D. Torres	<b>Art Unit</b> 2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to 35 USC § 103 rejections **of** claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

As per the 35 USC § 112, second paragraph, rejection of claim 1, the Applicant contends, "As previously stated, Applicants respectfully submit that the use of the term "based on" in the claims is not vague or indefinite, merely broad."

The Examiner disagrees and asserts that neither the claim nor the specification provide the basis for which the maximum error rate is used in the determining process. The Examiner asserts that, it is not clear whether some other factor such as SNR which is a function of error rate is used as the basis for determining and hence the term based on is being used in its broadest sense, that since the process of decoding is based on Maximum error rate, any decoding step is implicitly dependant upon Maximum error rate or whether the Applicant believes that the Applicant has taught, in the specification, the direct calculation of an error rate for use in the decoding process. For now the Examiner assumes the Applicant is using "based on" in the broadest sense that since the process of decoding is based on Maximum acceptable error rate, all steps of decoding are inherently also based on Maximum acceptable error rate. However, it is still not clear whether this is the Applicant's intention.

The Applicant's arguments are confusing at best. On the one hand, the Applicant states that the claim language is meant to be broad and on the other hand the Applicant states that the Applicant would like an interpretation that is not quite as broad as what the Examiner is using. The Applicant can easily clarify by stating exactly how broadly the Applicant would like the Examiner to interpret the language and by providing support in the specification for that interpretation.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. Claim 1 recites, "determining a maximum number of iterations among a plurality of integers corresponding to a maximum number of iterations to be applied by the iterative decoding process on a coded data block, **based on** the maximum error rate" [Emphasis Added]. Missing is the relationship between "determining a maximum number of iterations" and "the maximum error rate" and, in particular, the basis or the role maximum error rate plays in determining a maximum number of iterations.

Claims 10-13 recite similar language.

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Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites, "determining a maximum number of iterations among a plurality of integers corresponding to a maximum number of iterations to be applied by the iterative decoding process on a coded data block, based on the maximum error rate" [Emphasis Added]. The term "based on" is indefinite since it does not set forth the basis or the role maximum error rate plays in determining a maximum number of iterations.

Claim 10 recites, "determining a maximum number of iterations among a plurality of integers corresponding to a maximum number of iterations to be applied by the iterative decoding process on a coded data block, based on the maximum error rate" [Emphasis Added]. The term "based on" is indefinite since it does not set forth the basis or the role maximum error rate plays in determining a maximum number of iterations.

Claim 12 recites, "determining a maximum number of iterations among a plurality of integers corresponding to a maximum number of iterations to be applied by the iterative decoding process on a coded data block, based on the maximum error rate" [Emphasis Added]. The term "based on" is indefinite since it does not set forth the basis or the role maximum error rate plays in determining a maximum number of iterations.

Claim 13 recites, "determining a maximum number of iterations among a plurality of integers corresponding to a maximum number of iterations to be applied by the iterative decoding process on a coded data block, based on the maximum error rate" [Emphasis

Added]. The term “based on” is indefinite since it does not set forth the basis or the role maximum error rate plays in determining a maximum number of iterations.

Claims 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. Claims 10, 02 and 13 recite, “determining a maximum number of iterations among a plurality of integers corresponding to a maximum number of iterations to be applied by the iterative decoding process on a coded data block, **based on** the maximum error rate” [Emphasis Added]. The omitted structural cooperative relationships are: the relationship between “determining a maximum number of iterations” and “the maximum error rate” and, in particular, the basis or the role maximum error rate plays in determining a maximum number of iterations.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 6 and 10-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Xu; Shuzhan J. (US 6829313 B1).

35 U.S.C. 102(e) rejection of claims 1 and 10-13.

Xu teaches receiving, at a receiver, coded data sent by a transmitter (see Fig. 7 in Xu) and determining, prior to performing the decoding process, but after receiving the received coded data, and based on the maximum acceptable error rate, a submultiple block size among a plurality of integer block sizes  $N/k$ , which are submultiples of an integer block size  $N$  by an integer factor  $k$  greater than or equal to 1, wherein  $k$  is a factor of  $N$  (col. lines 47-50 in XU teach shrinking successive learning periods needed for reliable computation as iteration proceeds through windows in a block of code; col. 5, lines 60-63 in Xu teaches that the learning period  $P$  depends on the rate and constraint length of the code and the expected channel conditions; col. 7, lines 40-43 in Xu teach that the learning period  $P$  is adjustable depending on extrinsic information from the decoder after data has been received; col. 6, lines 42-44 in Xu teaches a sliding window is defined having an adjustable length  $L$  which is equal to the previously described adjusted learning period  $P$ ; col. 7, lines 46-49 teach that a sliding window is defined having a length  $L$  such that some multiple  $k$  of  $L$  equals the total trellis length,  $N=kL$ ; Note: the length  $N$  of a Trellis is the block size of data being decoded and a sliding window divides the Trellis block into sub-blocks for calculating forward and backward metrics over the sub-blocks; Note also that reliable computation clearly suggest that decoding is based on a maximum acceptable error rate since anything less

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than a maximum acceptable error rate would not provide reliable computations, hence; Xu teaches determining, prior to performing the decoding process, but after receiving the received coded data, and based on the maximum acceptable error rate required for reliable computation, a submultiple block size among a plurality of integer block sizes  $L=N/k$ , which are submultiples of an integer block size  $N$  by an integer factor  $k$  greater than or equal to 1, wherein  $k$  is a factor of  $N$ ); and a maximum number of iterations among a plurality of integers corresponding to a maximum number of iterations to be applied by the iterative decoding process on a coded data block of the submultiple block size, such that a mean number of iterations that will be applied by the iterative decoding process on the submultiple block size is minimized (col. 2, lines 47-57 in Xu teaches that the block size adjustment is used to reduce the required number of iterations).

35 U.S.C. 103(a) rejection of claim 6.

Col. lines 47-50 in XU teach shrinking successive learning periods  $P=L=N/k$  needed for reliable computation as iteration proceeds through windows in a block of code. Note: In order to shrink Block size  $L$ ,  $k$  must increase from an original value  $k_{min}$ .

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 2-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu; Shuzhan J. (US 6829313 B1) in view of Zhang; Vicki Ping et al. (US 6233709 B1, hereafter referred to as Zhang).

35 U.S.C. 103(a) rejection of claims 2, 8 and 9.

Xu substantially teaches the claimed invention described in claim 1 (as rejected above).

In addition, col. 2, lines 47-57 in Xu teaches that the block size adjustment is used to reduce the required number of iterations and col. 5, lines 60-63 in Xu teaches that the learning period P depends on the rate and constraint length of the code and the expected channel conditions. Col. 8, lines 42-55 in Xu teach the use of SNR to measure reliability of channel conditions.

However Xu does not explicitly teach the specific use of a stop criterion for operating the turbo decoder of Figure 8 in Xu.

Zhang, in an analogous art, teaches use of a stop criterion for operating the turbo decoder of Figure 8 in Xu (Blocks 208 and 214 in Figure 2 in Zhang teaches the iterations being stopped if the block of said submultiple size satisfies a predetermined

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reliability criterion, or if the number of iterations for the block attains the given maximum number of iterations.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Xu with the teachings of Zhang by including use of a stop criterion for operating the turbo decoder of Figure 8 in Xu. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a stop criterion for operating the turbo decoder of Figure 8 in Xu would have provided a means for optimizing iterations in a turbo decoder.

35 U.S.C. 103(a) rejection of claims 3-5.

Col. 2, line 9-13 in Zhang teach that the determination of  $N_{\min}$  and  $N_{\max}$  may be made based on data tables stored in memory.

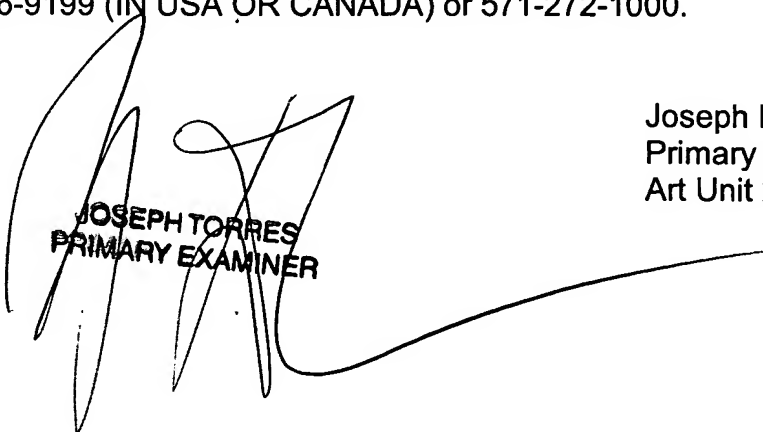
35 U.S.C. 103(a) rejection of claim 7.

Figure 2 of Zhang teaches that the number of iterations is never allowed to exceed the maximum number of iterations hence the selected frame size  $N/k$  will always be limited so that the mean number of iterations is always less than the maximum number of iterations.

**Conclusion**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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PRIMARY EXAMINER

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Art Unit 2133